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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/600,637
Filing Date: June 20, 2003
Appellant(s): HAYNER ET AL.

Ryan S. Davidson

For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed September 8, 2008 appealing from the Office action mailed October 16, 2007.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

Originally filed claims:	1-37.
Claim cancellations:	1-20.
Added Claims:	None.
Presently pending claims:	21-37.
Presently appealed claims:	21-37 (17 claims).

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct. There is no amendment after final rejection.

(5) Summary of Claimed Subject Matter

The summary of invention contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

The only ground of rejection under 35 U.S.C. § 102(b) remaining is that regarding Claims 21-37 are anticipated by Watanabe et al (U.S. Patent No. 6,298,019).

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

Evidence is used by the examiner in the rejection of the claims under appeal:

U.S. Patent 6,298,019 Watanabe et al. October 2, 2001

(9) Grouping of Claims

Appellant's brief include a statement that:

1. independent Claim 21 and its dependent Claim 22 stand and stand or fall together;

2. independent Claim 23 and its dependent Claims 24 and 25 stand and stand or fall together;

3. independent Claims 26 and 36 and their dependent Claims 27-30 and 37 stand and stand or fall together; and

4. independent Claim 31 and its dependent Claims 32-35 stand and stand or fall together.

(10) Grounds of Rejection

The following ground of rejection is applicable to the appealed claims 21-37:

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> *A person shall be entitled to a patent unless--*
> *(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.*

2. Claims 21-37 re rejected under 35 U.S.C. § 102(b) as being anticipated by Watanabe et al. (U.S. Patent 6,298,019).

3. Watanabe teaches a disk servo control method having all of the steps as recited in claims 21 and 22. For example, Watanabe teaches the following:

(a) a first actuator control law portion 120 comprising an input 116,117 to receive a representation of a first actuator position (Tracking error), and an output TC (Fig. 1; column 17, lines 61-64; the tracking servo circuit has an input and an output) a second actuator control law portion 1133 comprising an input to receive a representation of a second actuator position (focusing error), and an output FC; (Fig. 1; column 18, first

two lines; the focusing servo circuit has an input and an output); a first actuator decoupler portion 129 comprising a first input TE coupled to the output of the first actuator control law portion 120 and a second input FE coupled to the output of the second actuator control law portion 133 (Fig. 1; both TC and FC are connected to DSP 129), and an output (connected to the gain changers) to provide a signal with decoupling compensation (gain) for a first actuator (tracking actuator 130) based on the representation of the second actuator position (TC is compensated by a gain change means 122 which based on the gain chain 121 of the second actuator control law portion 133; column 39, liens 27-34).

(b) With respect to Claim 22, the first actuator decoupler 129 comprises a linear modification module (amplifier in the DSP) having an input FE coupled to the output of the second actuator control law portion 133, and an output to provide a linearly scaled representation of a value received at its input (Fig. 1; DSP provides linearly scaled output such as digitization and amplification); wherein the linearly scaled representation is used to provide the signal with decoupling compensation for the first actuator decoupler portion (Fig. 1; gain compensation means 121, 122 and 127 are a series of feedback means).

4. Watanabe teaches an optical disk drive having all of the elements and means as recited in claims 23-25. For example, Watanabe teaches the following:

(a) a focus control loop (Fig. 1; focusing is a servo operation); a tracking control loop (Fig. 1; focusing is a servo operation), wherein the focus control loop and the tracking control loop are cross-coupled (Fig. 1; gain change means 121, 122 and 127 provide the cross link), wherein a focus control command (operation) excites (starts/causes) the tracking control loop (read track address and then track jump) and a tracking control command excites (starts/causes) the focus control loop (track jump and then focus on the seek target); and a decoupler 129 configured to produce a modified focus control command (gain change) from the focus control command and the tracking control command (gain change means 121, 122 and 127 are in form of a cascade stage), and configured to produce a modified tracking control command (gain change) based on the tracking control command and the focus control command (Fig. 1), wherein the modified focus control command has a different excitation (different gain change) of the tracking control loop than the focus control

command and wherein the modified tracking control command has a different excitation (different gain change) of the focus control loop than the tracking control command (Fig. 1).

(b) With respect to Claim 24, a lens assembly 105, wherein the focus loop comprises a focus actuator 103, 104 configured to move the lens assembly in a focus direction (Fig. 1).

(c) With respect to Claim 25, a lens assembly 105, wherein the tracking loop comprises a tracking actuator 103, 104 configured to move the lens assembly in a tracking direction (Fig. 1).

5. Claims 26-30 have limitations similar to those treated in the above rejection, and are met by the reference as discussed above. Claim 26 however also recites the following limitations which are also disclosed by the prior art of Watanabe:

(a) with respect to Claim 26, determining cross-coupling characteristics (servo gains) of a focus actuator and a tracking actuator of an optical pickup unit (Fig. 1; gain means 121, 122 and 127 for focusing and tracking operations are a servo loop which can be considered as a cross-coupling characteristics); determining a decoupling matrix to decouple the focus actuator and the tracking actuator (Fig. 1; DSP 129 and gain change means

forms a servo loop having servo parameters which can be considered as a de-coupling matrix of tracking and focusing).

6. Claims 31-35 have limitations similar to those treated in the above rejection, and are met by the reference as discussed above. Claims 32-35 however also recite the following limitations which are also disclosed by the prior art of Watanabe:

(a) with respect to Claim 32, the decoupler 129 modifies a focus command to have a reduced effect on a tracking position of the lens assembly and modifies a tracking command to have a reduced effect on a focus position of the lens assembly (Fig. 1; gain change means 121, 122 and 127 are cascaded in a series mode which modifies a tracking mode and a focusing mode).

(b) with respect to Claim 33, the decoupler is a software routine stored on computer readable media (Fig. 1; servo operation is written in software in form of a routine and stored in the DSP 129 as illustrated in Fig. 17).

(c) with respect to Claim 34, the decoupler 129 is an analog circuit (Fig. 1; servo processing 129 includes analog circuit).

(d) with respect to Claim 35, the decoupler 129 is an electro-mechanical circuit (Fig. 1; DSP includes actuators 130 and 131 which are electro-mechanical circuit).

8. Claims 36 and 37 have limitations similar to those treated in the above rejection, and are met by the reference as discussed above. Claim 36 however also recites the following limitations which are also disclosed by the prior art of Watanabe:

(a) with respect to Claim 36, determining cross-coupling characteristics of a focus actuator and a tracking actuator of an optical pickup unit (Fig. 1; servo loop characteristics is the cross-coupling characteristics); determining a decoupling matrix to decouple the focus actuator and the tracking actuator (Fig. 1; DSP 129 and its servo processor include de-coupling matrix/servo parameters of tracking and focusing).

(11) Response to Argument

Applicant's Appeal Brief filed on September 21, 2008 has been fully considered.

Appellant states that the prior art of Watanabe fails to reveal any support that the gain circuits 121, 122 and 127 are connected or cascaded in series or that the output of one actuator control signal affects another actuator control signal in any manner (page 6 of the Appeal, second paragraph, lines 1-4). In page 7 of the Appeal, Appellant states that the series connections between the gain change circuits 121, 122, and 127 is merely a drafting artifact (page 7 of the Appeal, lines 5 and 6). Accordingly, the prior art of Watanabe tracking gain change 122 is affected by the focus gain change 121. For example, In case of a dual-layer disk as illustrated in Fig. 6a, the focus gain for each layer L0 and l1 has an assigned value (column 39, last two lines). In addition, the tracking gain is changed according to the layer L0 and L1, respectively (column 39, lines 6-21). In other words, each layer L0 and L1 has an assigned tracking and focusing gain value, respectively, and therefore, the switching a layer to perform read/write operation not only affects the focus gain but also tracking gain. Since the focus gain and the tracking gain between layer L0 and l1 are changed accordingly, Watanabe's Fig. 1 illustrating that the series

connected gain change means 121, 122 and 127 is correct and not a drafting artifact.

Furthermore, Appellant states that the prior art of Watanabe fails to disclose that there is any cross-coupling or de-coupling between the focus control and the tracking control operation (page 8 of the Appeal, last 7 lines). Accordingly, Appellant's cross coupling and de-coupling means are used to modify control law (abstract). Similarly, the prior art of Watanabe's focus gain and tracking gain are modified by each other based on the disk layer L0 and l1.

Regarding to Claim 23, Appellant further states that the prior art of Watanabe fails to disclose that the tracking control command on the tracking component excites the focus component of Watanabe, or vice versa (page 10 of the Appeal, lines 11 and 12). Accordingly, the tracking and focusing gain change means 122 and 121 forms a servo loop, any change of gain value inside the loop will excite a sequence of servo operations on both the tracking gain and the focusing gain. For example, a jump pulse FEJMP from the focusing operation (Fig. 11) will switch off the tracking operation (Fig. 10). On the other hand, the tracking operation will excite the preventive operation of an objective lens being moved in a focusing direction.

Regarding Claims 26 and 36, Appellant states that the prior art of Watanabe fails to disclose the subject matter "determination cross-coupling characteristics" and "determining a decoupling matrix" (pages 12 and 13, lines 17 and 11-13 respectively). Accordingly, the prior art of Watanabe's gain change means 121, 122 and 127 forms a servo loop control means which has cross-coupling control paths linked to each gain change means like a matrix in order to carry out control signals so that the servo loop control means function under assigned characteristics.

Regarding Claim 31, Appellant states that the prior art of Watanabe fails to disclose the subject matter "decoupler" (page 14, last line to page 15, first 3 lines). Accordingly, the prior art of Watanabe's gain change means 121, 122 and 127 forms a servo loop control means which has a de-coupling function. For example, a jump pulse FEJMP from the focusing operation (Fig. 11) will switch off (de-couple) the tracking operation (Fig. 10). On the other hand, during the tracking operation the objective lens will be prevented from moving in a focusing direction, i.e. it is de-coupled.

For the above reasons, it is believed that the rejection of Claims 21-37 are proper and therefore the final rejection of Appellant's Claims 1 and 4 should be sustained.

(12) No Related Proceeding Identified

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

Respectfully submitted,

/HOA T NGUYEN/
Supervisory Patent Examiner,
Art Unit 2627

Conferees:

SPE: /Andrea L Wellington/
Supervisory Patent Examiner, Art Unit

Examiner: /CHU, Kim-Kwok/

December 9, 2008